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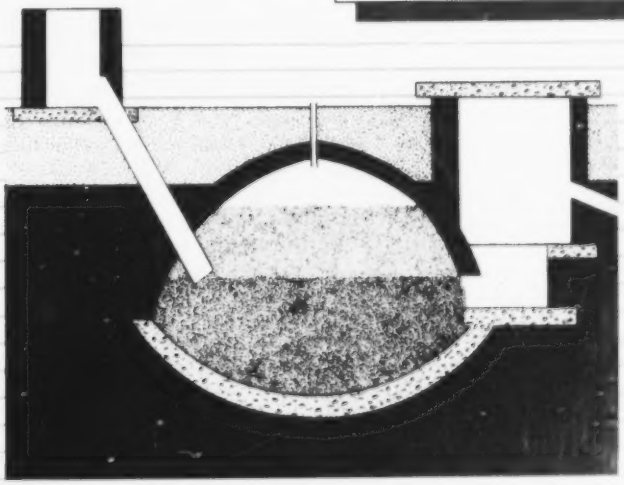

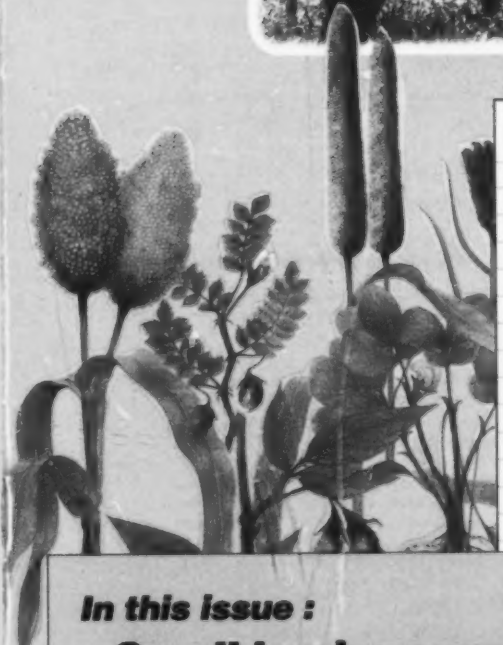

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The emblem of Technical Cooperation among Developing Countries (TCDC) displays a symbolic bridge joining the countries and people of the Southern hemisphere. The centre of the emblem — where the Southern, Northern, Eastern and Western parts of the world join — symbolizes a further and ultimate objective of TCDC: the promotion of truly global partnership for development.

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Nurturing Small Businesses: A Challenge for the South

Rustam Lalkaka discusses the importance of small and medium enterprises (SMEs) and explores some of the ways in which Southern countries can assist each other in developing their SMEs to meet the challenges of today's rapidly changing economic and technical environment. The author, an Indian technology development expert, formerly headed the Fund for Science and Technology of the United Nations Development Programme (UNDP). He now works as research professor on international business development at Northwestern University, Illinois, USA, and as a consultant to UNDP's Division for Private Sector in Development.

The concept "small is beautiful" was long relegated to the fringes of economic thinking. Now it is coming into its own. In business, as in many other arenas, small is not only beautiful — it is increasingly what the realities of the modern world dictate.

The New Technological Environment

The reasons for this lie partly in the technological revolution that has now reached a new phase of intensity. One aspect of this is the astonishing dimensions that have opened up in information technology and communications, producing satellite links, the CD-ROM, virtual reality, faxes, modems and electronic mail. The implications of this for management, manufacturing and marketing are enormous. For instance, in the old days when a company had to spend a large proportion of its budget on outreach activities — soliciting customers, dealing with business partners, sending out information — the larger firms were at an advantage. Today these costs have been slashed by computing and communications technology, making it much easier for smaller firms to compete.

Another aspect of the technological revolution is what is happening in biotechnology. In this area, risks are enormous, but so are the potential profits, even for relatively small enterprises with low capital outlays. In addition, the growth of biotechnology is changing the metaphors that we use. Formerly we used to think of organizations as machines. Now, increasingly, we think of them as organisms. Again, this encourages us to think small. If enterprises are organisms, the future lies not with the slow-moving dinosaurs of the old economic order but with nimble entities that can adapt quickly to change and flourish in symbiosis with their larger neighbours.

All this is good news for the South, where micro, small and medium-scale businesses constitute the bulk of total enterprises by number. Generally the term micro applies to enterprises employing less than five people, small signifies 5 to 50 employees, and medium means 50 to 200. In many countries enterprises in these categories account for more than half of industrial employment and as much as a third of the national product. They tend to be highly innovative, make excellent use of scarce capital and skills, and provide a range of services and goods to the large corporations.

In the past, UNDP and its partner agencies have helped build a variety of institutions for supporting SMEs, while the World Bank has provided US$300-400 million a year as special credits. The model of the government-subsidized small industry service institute (SISI) has been replicated in many countries, but these SISIs tend to lose their vitality as the entrepreneurs become more advanced than the poorly paid service-providers. Evaluations of these multilateral assistance and credit programmes show that impacts have often been poor and results unsustainable. The main reason was that developing country partners were poorly selected, with over-reliance on government agencies. Furthermore, the end-users of technical assistance were barely involved in the design process and the full range of support needed was not tackled in an integrated manner.

Mobilizing Entrepreneurial Skills

Many developing countries have nascent entrepreneurial talent which, despite all obstacles, has created a variety of self-owned businesses, particularly in the informal sector. Similar skills have been lying dormant for 40 years or more in Eastern Europe and the former Soviet Union, where until

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recently entrepreneurship was considered to be a deviant activity, and large centrally-directed combines were the norm.

New ways are now being explored in the developing world and the former centrally planned economies to upgrade and privatize the state-owned behemoths, and concurrently create a new generation of small entrepreneurial businesses. These should grow rapidly to modernizing (and modern), medium-scale (and in some cases large) firms, which are quality conscious, environmentally correct and market-driven.

The countries of the South and the former socialist bloc are benefiting — often under UNDP auspices — by the exchange of experiences in this field. There are many similarities in their conditions: weak infrastructure and support systems, vast bureaucracies, poor access to information on trade and technology, lack of capital resources and small business management skills, and barriers to markets.

However, some developing countries are already well advanced in overcoming these problems and creating an active and flourishing small industry sector. Turkey, for example, has more than 200,000 SMEs, employing more than half a million people. These are supported by the Small and Medium Industry Development Organization, a semi-autonomous body which organizes a range of technical and advisory services to assist SMEs.

Another example is the outstanding Chinese achievement in setting up two million "township and village enterprises." These "non-state" entities now account for over 40 per cent of total industrial employment. India too is successfully promoting entrepreneurial SMEs through institutions such as the Entrepreneurship Development Institute at Ahmedabad and the National Small Industries Corporation at New Delhi, and the Indian experience in this field has already been transferred to a number of African countries. Cuba has developed excellent practices for reconditioning spare parts in small engineering shops, as was evident in a workshop in Havana in January 1993, sponsored by the Special Unit for TCDC. Mexico is launching a scheme for the "franchising" of entrepreneurship development products, while in Indonesia larger corporations are serving as "foster parents" to SMEs. Such experiences in creating and supporting SMEs can be immensely valuable to other developing countries.

Small and medium-scale enterprises in developing countries cover a wide range of activities. *Clockwise from top left:* Processing toxic waste for storage, Mexico; guitar-making, Honduras; one of the delegates to a TCDC meeting viewing electronic equipment at an exhibition in Seoul, Korea; marble-working, Turkey.

Synergy through Networks

Networks can play a useful role in such interaction provided that the co-ordinating centre and nodal points have similar capability levels and are committed to sharing their skills in a whole-hearted manner. Good examples of such synergy in Asia are the Hangzhou Regional Training Center for Small Hydropower, located in China, and the Regional Network for Agricultural Mechanization, based in the Philippines.

For exchange of business and technical information, the Group of 77 is developing a trade information network that has received support from UNDP. This itself can benefit by the experience of TIPS (the Technological Information Pilot System), based in Rome, Caracas and Manila and serving both large and small enterprises. The decentralized TCDC-INRES database can be augmented to include more institutions offering training and expertise capacities in SME promotion.

Incubating New Businesses

An increasingly widely used system for nurturing small enterprises is the business incubation centre. These centres are managed work premises, accommodating a number of start-up businesses. They are generally established on a not-for-profit basis through the combined initiative of local government and the private sector. Here a fledgling entrepreneur can rent working space and share certain facilities and services with the other businesses in the centre. Advisers are mobilized from the community to help the entrepreneur write a business plan, develop management skills and access seed money, trade information and markets. Accountancy and legal services may also be available. All this is provided as an integrated, affordable package. After a year or two of such nurturing, most businesses become viable and must leave the incubator to make way for other entrepreneurs. Some go broke and must leave anyway.

To be effective and sustainable, the incubators must be part of the organic life of the economy and community as a whole. For example, a new technology-based business growing up in an incubator must be constantly aware of and have easy access to relevant research being carried out in its sector. For this reason many technology-focused incubators are located in or near a research facility or technical university. In Turkey, for instance, incubators, or "techno-parks," are now attached to the universities at Istanbul, Ankara, Izmir and Eskisehir. The Izmir centre is expected to develop a capability for the training of incubator managers from developing countries. In China over 30 technology business incubators have

been set up, linked to technical universities, science and technology agencies, and provincial governments. Others have been initiated through UNDP assistance in India, Nigeria, the Philippines and Uruguay.

Today there are over 800 incubators worldwide, including about 60 in developing countries. UNDP's programme of assistance to business incubators was begun by the United Nations Fund for Science and Technology for Development in 1987, and today UNDP is assisting some two dozen countries in all regions of the world in adapting this concept to their special needs and to the objectives of regional development, industrial sub-contracting, technology transfer and international linkages. Many important lessons have been learned, such as the need to involve local beneficiaries in the design of the incubator, and to secure the required capital resources well in advance.

We are now moving towards the "second-generation" incubator. This functions as a business development centre and provides a wide range of advisory and support services for a mix of tenants in the incubator space as well as other clients outside. It becomes a catalytic, private-state component of a national enterprise promotion strategy. This is the model now being developed by UNDP's Division for Private Sector in Egypt, Indonesia, Morocco and West Africa (in association with the United Nations Economic and Social Commission for West Africa).

Creating Technology-based Enterprises

Looking to the future, conditions need to be created to enable SMEs to grow more rapidly and, more importantly, to operate on a higher technological level than has been typical in the past. Some developing countries now have the infrastructure and skills to produce goods and services that are relatively advanced technologically. Southern SMEs need to move selectively in this direction and to produce goods and services of higher knowledge-content and better quality at lower cost. In this effort, developing countries can do much to assist each other, using TCDC approaches.

The TCDC workshop held in October 1991 in Seoul, Korea, focused on SMEs in electronic and electrical goods. Some of the 135 participants, including many private sector firms, were able to initiate collaboration arrangements with each other.

Another significant TCDC event in this connection was the Inter-regional Workshop on Creation and Strengthening of Technology-Based Enterprises, held in November 1991 in Cuernavaca, Mexico. This was sponsored jointly by UNDP and the Morelos Technology Business Incubator (CEMIT). It brought together entrepreneurs, researchers, financiers and planners for candid exploration of five themes: policies to support technology-based enterprises; linkages between universities, research centres, technology parks/incubators and business enterprises; training in technology management and entrepreneurship; financial mechanisms; networking and international cooperation.

The results of the workshop have been impressive — and continuing. The Mexican representatives met at breakfast on the last day to discuss the possibilities of closer collaboration, and as a result the Mexican Association of Business Incubators and Technology Parks (AMIEPAT) was established. The East Europeans — Hungary, Poland and former Yugoslavia — formed a coalition which continues to be active, while Brazil, Costa Rica and Hungary are working together on training in entrepreneurship and technology management.

Another important outcome was that the workshop participants drew up a proposal for a Third World Incubator Network (TWIN) "to promote and strengthen business incubators and technology parks in developing countries through continuous exchange of experiences and information among them." As a step towards this, the Latin Americans have finalized a regional network, to be linked to global efforts including the existing National Business Incubation Association in the United States, and the European Business and Innovation Centre Network, based in Belgium.

Towards National SME Strategies

SME development and business incubators have to be seen as components of a national enterprise promotion strategy, to be implemented through a partnership between the government, the private sector, universities and non-governmental organizations. The state has to create the macro-economic and legislative framework together with the required support mechanisms. These have then to be operated in a business-like manner, mobilizing the acumen and entrepreneurial capacities of the private sector.

Already many developing countries have shown that they have the managerial capacity, the inventiveness and the technical skill to create a thriving and progressive SME sector. They have also demonstrated that there is much to be gained by sharing their experiences in this crucial field. ■

Boosting Rice Production in West Africa

Gambian journalist Ebbou M. Waggeh writes about the importance of rice in West Africa and describes how the countries of the sub-region are collaborating among themselves and with other regions of the developing world to increase production of the crop.

Rice is a crop that many people associate primarily with Asia. Yet it is also indigenous to Africa, and in many parts of the continent it has been cultivated for over a thousand years. In some West African countries, such as the Gambia, it is the most important single foodstuff. Rice accounts for 53 per cent of the average Gambian's calorie intake, and the country as a whole consumes up to 80,000 tonnes of rice each year. Only about a quarter of this, however, is locally grown, the remainder being supplied by imports. Neighbouring countries also rely to a greater or lesser extent on rice importation. In total, West Africa imports some US$600 million worth of rice every year from outside the region.

Not surprisingly, therefore, the countries of the sub-region are anxious to increase their own capacity for rice production. In this effort, South-South cooperation is playing an important role, as the case of Gambia shows.

There are three main types of rice-growing terrain in the Gambia: swamp, irrigated land and rainfed upland. Traditional types of rice found in the Gambia include the tall-stemmed, long-duration varieties that are cultivated widely in the swamp areas. These, however, are gradually being replaced by the shorter-stemmed, shorter-duration varieties recommended by the government's agricultural extension service because they yield more crops per year and because of their greater tolerance to salty conditions. Salty terrain is a major production constraint, especially in the mangrove areas and some of the tidal swamps along the lower part of the river.

The earliest attempts to grow rice under irrigation in the Gambia were made by the Commonwealth Development Corporation in the early 1950s. However, it was the Taiwanese who first succeeded, between 1966 and 1976, in growing irrigated rice on a large scale. They developed 1200 hectares for pump irrigation along the flood plains of the river Gambia. The Taiwanese were succeeded by rice experts from the People's Republic of China, who developed a further 800 hectares. Subsequently, the Jahally Patcharr Smallholder Project (JPSP), funded by the International Fund for Agricultural Development, developed over 2,000 hectares for pump and tidal irrigation between 1982 and 1990. The average annual yield in 1976 was 4.35 per hectare, which gradually increased over the following decade reaching a peak of 5.59 tonnes per hectare in 1984.

Indonesia is another country that has been assisting the Gambia in rice production through a project agreed at the capacities and needs matching exercise that was held in 1990 in Jakarta, Indonesia, with support from the Special Unit for TCDC of the United Nations Development Programme (UNDP). Under this agreement, 15 farmers from the Gambia went to Indonesia for a course in rice and other food crops production. The Gambians lived with host farmers in the villages and learned by doing. They also shared some of their own knowledge with their hosts. Activities covered included animal traction, weeding, fertilizer use, transplantation and seedbed preparation.

One of the Gambians who participated is Sajar Jawla, who works for the Food and Agriculture Organization of the United Nations (FAO), testing new farming methods and crop varieties at village level before they are adopted on a wide scale by Gambian farmers. He brought back from the course a rice variety, called *gogorancha* in Indonesian, which takes only 70 days to mature. Sajar feels that it will do well in upland conditions, but he is still in the process of testing it.

In addition to the help in rice growing received from other regions, the countries of West Africa are also engaged in an important collaborative effort with each other. This takes place through the West African Rice Development Association (WARDA), whose mandate is to help its 16 member countries become self-sufficient in rice production. Founded in 1970 with support from UNDP, FAO and the United Nations Economic Commission for Africa, WARDA became a member of the Consultative Group on International Agricultural Research (CGIAR) in 1986.

WARDA maintains two research stations, one in Sierra Leone, the other in Côte d'Ivoire. In addition there are trial areas in each of the member countries, representing different types of terrain, where the rice varieties developed in the

research stations can be tested. About twice a year a WARDA delegation of rice experts visits member countries to monitor progress in the trial areas. Last August, for example, a delegation visited the Gambia, Guinea-Bissau and Senegal to study the performance of new varieties from the Rokupr research station in Sierra Leone.

A number of high-yielding rice varieties, developed by WARDA, have already proved themselves suitable for cultivation and are now successfully grown by many farmers in the sub-region. One of the most popular is the variety known as Rok 5, developed at the Rokupr research station. Another popular variety is ITA 257, developed specially for soils with high iron toxicity. It is grown widely in the uplands of Nigeria.

The continuing effectiveness of WARDA will depend partly on whether it is able to obtain sufficient funding for its research programme. Another constraint is the difficulty in achieving quick dissemination of WARDA's innovations, as agricultural extension services in West Africa are often inadequate. If the farmers of West Africa are to benefit fully from South-South cooperation it will be necessary to find supplementary methods of technology transfer, such as by making greater use of grass roots non-governmental organizations (NGOs). Nevertheless, in WARDA West Africa possesses a valuable resource for South-South cooperation, which has already done much to help the sub-region's rice growers.

For further information contact:

The West African Rice Development Association
BP 2551, Bouaké, Côte d'Ivoire
Tel.: (225) 63-45-14
Cable: ADRAO Bouaké - CI.

India's Plant Bank

S.S. Ahluwalia, former Joint Secretary for International Cooperation in the Indian Ministry of Agriculture, describes the work of his country's National Bureau of Plant Genetic Resources and its contribution to South-South cooperation.

In order to grow enough food to meet the demands of an ever-increasing population, agriculturalists of the developing world must continually seek to improve the yield, disease-resistance, nutritional value and sustainability of the crops they cultivate. A critical role in these efforts is played by institutions that conduct research into plant genetics and maintain germplasm collections. The scientific study and management of plant genetic resources is important not only for food crops but also for plants used in medicine and other areas.

Over the past two decades, a number of institutions in this field have been established in developing countries. One of the most active is India's National Bureau of Plant Genetic Resources (NBPGR), established in 1976. It has its headquarters in New Delhi and possesses a network of subsidiary units located in other regions where plants can be tested under various different agricultural and climatic conditions. The Bureau maintains strong links with other related institutes in India, such as the International Crop Research Institute for Semi-Arid Tropics (ICRISAT) at Hyderabad, and acts as a coordinating centre for activities in the field of plant genetic resources. A computerized database at the headquarters contains up-to-date information on research in the field.

The NBPGR's germplasm bank is a botanical treasure house. Varieties are preserved there as seed or as plant tissue, which is kept under refrigeration until needed for

Over 180,000 varieties of plant are stored in the germplasm bank at the National Bureau of Plant Genetic Resources, New Delhi.

propagation. At present the bank contains over 180,000 varieties, but its capacity is currently being expanded to hold up to 800,000 samples. In addition to many types of wheat, rice, maize, millet, sugarcane, potato and other familiar crops, the bank also contains numerous rarer and lesser known plants. The NBPGR also has a plantation where a wide variety of crops are cultivated in the field. To obtain its samples, the NBPGR has built up teams of dedicated and sharp-eyed plant collectors, who often have to scour remote areas in India and elsewhere.

NBPGR scientists are continually testing the plants in their collection for resistance to pests and diseases as well as for yield, nutritional value and other qualities. Over the years they have tested and selected many varieties that are now proving to be of immense value to farmers, including various strains of tomato, okra, cowpea, gooseberry, pecan and mung bean.

Many of NBPGR's activities come under the heading of Technical Cooperation Among Developing Countries (TCDC). For instance, the Bureau works in close collaboration with a number of international bodies with which it continually shares its expertise and research findings. These include the International Maize and Wheat Improvement Centre in Mexico, the International Rice Research Institute in the Philippines, the International Potato Centre in Peru, and the International Centre for Agricultural Research in Dryland Areas, based in Syria.

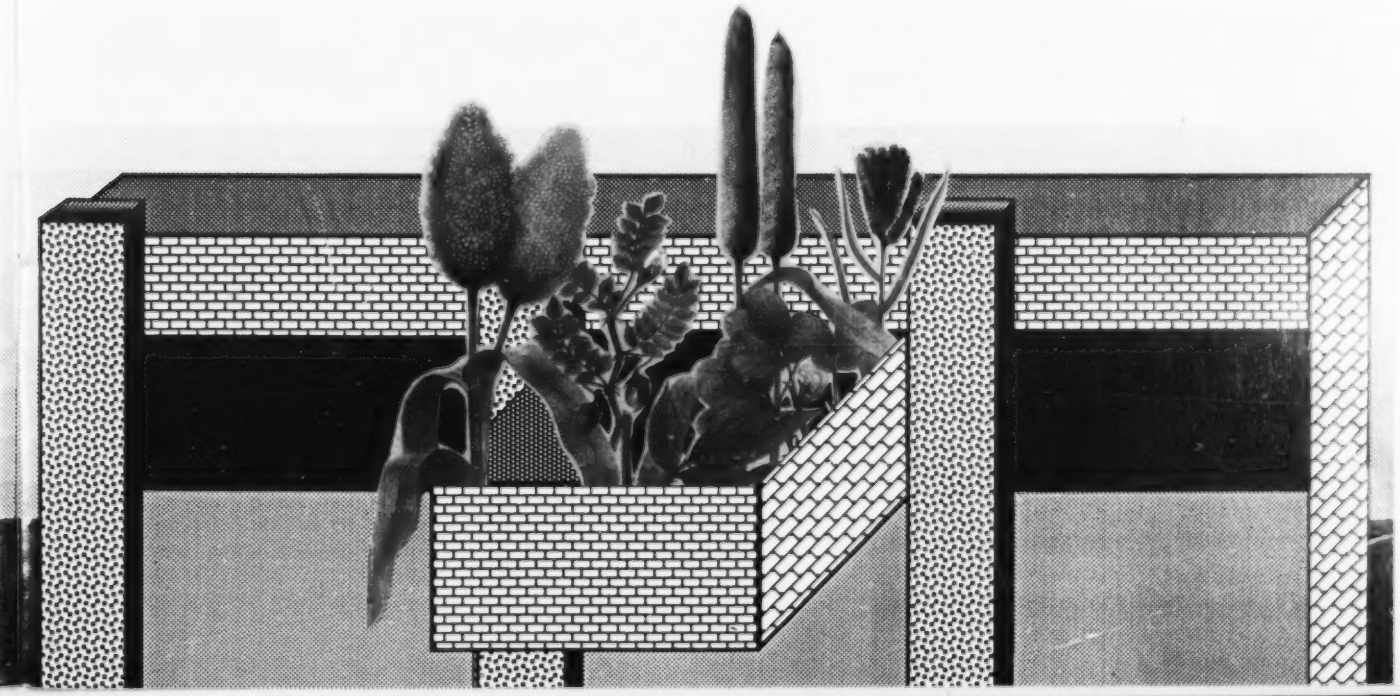
One of the Bureau's most important TCDC activities is carrying out germplasm exchanges with over 80 other developing countries, including China, Cyprus, Indonesia, Iran, Mongolia, Nepal and the Philippines. During the year 1990-91 the NBPGR received over 40,000 crop samples from 42 countries. Some of the most promising of these were varieties of maize from Mexico, rice from the Philippines, castor from Egypt and sweet potato from Peru. During the same period, responding to requests from 48 countries, the NBPGR exported over 2,000 germplasm samples, including wheat, rice, maize, barley sorghum, papaya and Napier grass.

Other TCDC activities of the NBPGR include training courses for participants from developing countries on genetic resources management, and joint expeditions to identify and collect germplasm. In collaboration with the International Board for Plant Genetic Resources, scientists from NBPGR have participated in explorations in Ethiopia, Kenya, Malawi, Mali, the Maldives, the Sudan, Zambia and other countries.

The NBPGR is fully committed to continuing its work with other developing countries to make good use of our precious collective heritage of plant genetic resources. Only by a collaborative effort in this area can we hope to meet the agricultural challenges that the South is facing.

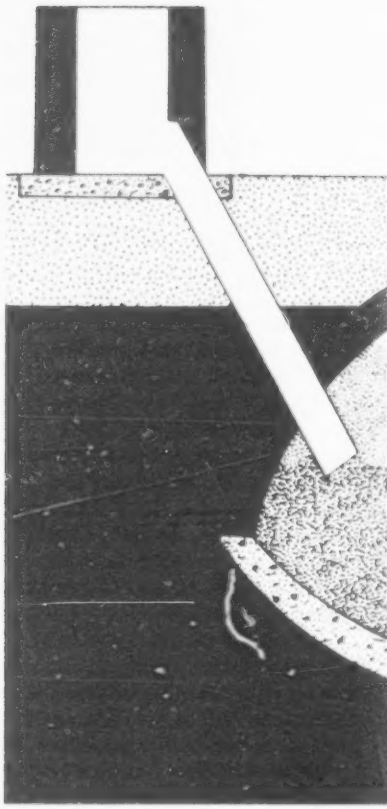
Further information can be obtained from:

National Bureau of Plant Genetic Resources, Pusa Complex New Delhi–110 012, India.



Energy from Biogas

Conserving Power and Protecting the Environment



At a time of growing global awareness of the need to conserve both energy and the environment, the use of biogas digesters as a waste treatment system and source of energy offers many advantages. One group with expertise in this field is Action for Food Production (AFPRO), a national non-governmental organization (NGO), based in New Delhi, which provides technical support to grass roots NGOs in India and other countries. In this article, Raymond M. Myles, executive director of AFPRO, explains the basic processes involved in biogas production and reports on the transfer of the technology to Cambodia.

Nocturnal observers over the centuries have been intrigued by the mysterious, flickering lights that can sometimes be seen hovering over the surface of swamps. People used to think they were ghosts or demons, but by the 18th century scientists had discovered that they were caused by an inflammable gas. This gas, now known as methane or biogas, is produced through the action of millions of bacteria breaking down vegetable, animal or human waste. Because the bacteria work in the absence of oxygen, the process is known as anaerobic digestion.

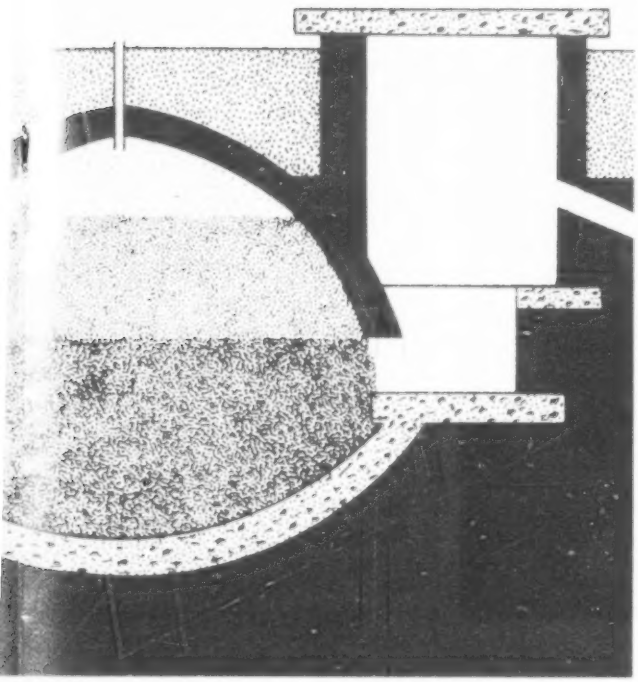
By the late 19th century this process had begun to be applied in the treatment of sewage, and practical uses were being discovered for the resulting gas. As early as 1897, in Bombay, India, methane from human waste was being used to provide lighting. Since then the process of producing biogas has been greatly refined, and today the technology is being used increasingly as an energy source and a method of treating waste in many parts of the world.

Today more than half the world's people cook and heat with firewood, dung and crop residues. These methods, however, are becoming increasingly unsustainable. The use of firewood depletes the forests, and the burning of dung and agricultural residues wastes precious nitrogen, phosphorus, potassium and other nutrients that could be returned to the soil. Biogas production from organic materials not only provides energy but also leaves a nutrient-rich effluent that makes a superb fertilizer and soil conditioner. This material can be as much as 30 per cent more effective than raw manure in raising agricultural productivity. This is because it has a higher nitrogen content than ordinary compost, and the action of the bacteria enhances the nutritional effect of the nitrogen.

Biogas technology is also of great benefit in the area of public health and pollution control. It is a highly efficient method of treating sanitation wastes, reducing their harmful bacterial and parasitic content by over 90 per cent. It can thus help to prevent infection from drinking water, which in many rural areas is untreated.

Biogas plants, or "digesters", come in many different designs, but the most common in developing countries is the fixed dome variety, originally developed in China. This consists of a gas-tight digester made of brick, stone or poured concrete, with hemispherical floor and ceiling. Waste mixed with water is poured in through an inlet pipe. As bacteria break down the waste, gas accumulates in the dome and flows out through a pipe set into the cover of a manhole in the roof. Effluent is displaced into a smaller tank beside the main digester.

It is this design of digester that has been transferred by AFPRO to Cambodia as well as to Nepal and to a number of African countries, using a variant known as the *Deenbandhu* (meaning "friend of the poor" in Hindi). This model was designed by AFPRO and rigor-



Left: **Basic design of the *Deenbandhu* biogas plant, developed in India and now being transferred to other developing countries.** ***Below:*** **Cambodians constructing a biogas digester near Phnom Penh, under the supervision of Indian experts.**

A working biogas plant in India

ously tested under different geographical and climatic conditions for over a year. In 1986, India's Ministry of Non-Conventional Energy Sources approved the model for large-scale dissemination in India, and it is currently the cheapest model available in the country as well as being one of the strongest. It is capable of being adapted to locally available construction materials.

A number of factors have made the Cambodians interested in the development of biogas technology. At a time when the country is still re-establishing its agricultural base after the devastation that occurred during the civil turbulence of the 1970s, the Cambodians are receptive to technologies from other developing countries that can assist the recovery process.

Up to the 1960s, some three quarters of the country was covered by forest. Since then, however, large-scale deforestation has occurred, as trees have been used up for fuel, rubber and timber. As firewood is the principal source of

Cooking with biogas in a rural Indian household.

fuel in Cambodia, it is clearly desirable for the country to develop alternative sources to reduce the deforestation.

Being an agrarian country with a large number of farm animals, Cambodia has excellent conditions for biogas technology. Taking into account both human and animal waste, it is estimated that enough gas could be generated to meet the energy requirements of 50 per cent of the present Cambodian population of some eight million. Climatic conditions are also favourable, as the country does not have a winter season, the temperature ranging from 21 to 35 degrees Celsius. This is a great advantage for biogas generation, as the efficiency of the digestion process is reduced by cold weather.

In 1989 the Vice Minister in charge of the veterinary department of Cambodia's Ministry of Agriculture led a government delegation to India to explore the possibilities of technical cooperation. An important item on their three-week study tour was AFPRO and its experimental farm, located at Aligarh, 120 kilometres from New Delhi. Here they saw biogas technology in action and decided that they would like to try it in Cambodia.

The outcome was that AFPRO sent a group of biogas experts to Cambodia in August and September 1990 to conduct a series of training sessions. Travel and living allowances were paid by the Church World Service (CWS), an international NGO which, among its other activities, supports technology development.

Training took place in various stages. First, a three-day workshop was held in Phnom Penh for senior government officials and representatives of international NGOs working in Cambodia. The purpose of the workshop was to give participants a general orientation in biogas technology.

The next stage was to hold a training for 14 Cambodians who would become supervisors in the construction of biogas digesters. The building of a biogas plant and gas distribution system draws on knowledge from various fields, including structural and chemical engineering and gas flow dynamics. The drawings of the plant have to be followed carefully and all the dimensions strictly adhered to. Therefore an appropriately trained technical supervisor is essential. This second level of training, lasting 18 working days, covered all aspects of the supervisor's job. It was conducted at the National Draught Cattle Breeding Station at Phnom Tamao, 45 kilometres from Phnom Penh.

In the third stage, lasting about 25 working days, 15 Cambodian masons learned the construction method by participating in the building of three biogas plants, two at Phnom Tamao and the third at the village of Svay Pak. The two digesters at Phnom Tamao were for cattle manure, while the third was for pig manure.

Certain difficulties were experienced during the training. For example, the Cambodians use bricks that are about half the size of the standard Indian brick. So we had to revise our calculations to include a larger number of bricks and therefore more cement and sand. Another constraint was the language factor. The trainees spoke little English, so AFPRO had to rely fully on interpreters.

When we began the training, the Cambodians found it difficult to imagine that it was possible to generate gas from cattle manure. When the first digester was complete and the first gas was drawn off they were astounded and delighted.

After completion of the training mission, the Cambodians who had been trained as supervisors were given the task of monitoring the performance of the digesters for one year and sending reports back to AFPRO. At the time of writing, two of the plants are working smoothly, while the third has experienced some difficulties. As these were the very first biogas digesters to be built in Cambodia, it is too early to say whether the

Biogas Technology: Directory of Institutions

The following institutions provide training and/or expertise in biogas technology:

Bulgarconsult Engineering Company, 130 Tzar Boris Street, Sofia 1000, Bulgaria
Tel: (359-2) 884820
Telex: 23201 BULCO BG

Empresa Paranaense de Assistência Tecnica e Extensão Rural
Rua da Bandeira
171 Curitiba, Parana, Brazil
Tel: (55-41) 253-2211
Telex: 041-5601.

Action for Food Production–AFPRO
25/1A Institutional Area, D Block
Pankha Road, Janakpuri
New Delhi 110058, India
Tel: (91-11) 555-5412
Fax: (91-11) 550-0343.

Rural Unit for Health and Social Affairs (RUHSA)
Christian Medical College & Hospital, RUHSA Campus
P.O. 632209
North Arcot Ambedkar District, Tamil Nadu, India
Tel: (91-416) 5253
Fax: (91-416) 25035.

Middle East Center for the Transfer of Appropriate Technology
P.O. Box 113-5474,
Beirut, Lebanon
Tel: (961-1) 346465.

Rural Services Research Institute
Koy Hizmetleri Arastirma Enstitusu
Ilica-Erzurum, Turkey
Tel: (90-9) 0128-1320
Fax: (90-9) 0128-1728.

country is likely to adopt the technology on a large scale. However, a good start has been made, and the viability of biogas technology for Cambodia has been clearly demonstrated. ■

TCDC in Food and Agriculture
Breaking New Ground in Latin America

In the first exercise of its kind in the region, representatives of 22 countries gathered in Buenos Aires, Argentina, last December to negotiate technical cooperation projects in the food and agriculture sector. Argentinian journalist Roberto Herrscher reports on the event.

The idea of holding a TCDC meeting on food and agriculture in Buenos Aires was inspired by the success of similar exercises in the past, particularly the one held in New Delhi, India, in October 1991. Present at the New Delhi meeting were Aldo Biondillo of Argentina's National Institute of Agricultural Technology and Moisés Lichtmajer, the Argentine government's coordinator of United Nations Development Programme (UNDP) projects.

"We realized Argentina's enormous potential for exchange of technology in food and agriculture," explained Mr. Lichtmajer, "and saw the advantages of holding a capacities and needs matching exercise of this kind in Latin America."

Following the initiative by Mr. Lichtmajer and Mr. Biondillo, the Argentine government, UNDP and the Food and Agriculture Organization of the United Nations (FAO), collaborated in organizing the exercise. Mr. Biondillo coordinated the event in conjunction with UNDP consultant Ramon Roldan and with the financial support of UNDP's Special Unit for TCDC. Representing the Special Unit were Graciela Vazquez-Diaz, Senior Regional Officer for Latin America and the Caribbean, and Edward C. White, Principal Information Officer.

In preparation for the negotiating meeting in Buenos Aires, a compendium of Argentina's capacities and needs was circulated among the invited countries, which in turn responded with offers and requests related to the Argentinian compendium. In Argentina, a Presidential notice about the exercise was published in the leading daily newspapers, and 139 Argentinian organizations and companies took part in the negotiations held in Buenos Aires. Of these, the majority (72) were from the private sector.

The success of the meeting exceeded expectations. In addition to the 19 participating countries from Latin America and the Caribbean, there were three from outside the region: China, Nigeria and the Philippines. Over 270 projects were negotiated, covering such areas as food technology, conservation of natural resources, biotechnology, crop production and animal health.

Guatemala agreed to train Argentina in the control and eradication of the cattle worm and the African bee. Argentina will send consultants to Nigeria to improve the production and marketing of potatoes and sunflowers. Chile will advise the Chinese on wine production. Ecuador will assist in improving the quality and marketing of bananas in the Dominican Republic. And Cuba will provide the Philippines with expertise on molasses and the use of sugar cane residues.

Matt Ivbijaro, head of Nigeria's Department of Environmental Conservation, was pleased with a commitment from Argentina's National Agricultural Technology Institute to assist his country in the produc-

tion of natural pesticides. "We attach great importance to this project," he said, "as we have noticed that the excessive use of chemicals is having a pernicious effect on our soil."

In one of the most interesting presentations of the meeting, Teofilo Aliaga, of the Peruvian Association of Exporters, described an ancient Inca technique for preserving potatoes with hardly any loss of weight. The method involves bringing the potato into contact with the *muña* plant, related to peppermint, which inhibits the growth of the potato roots. Aliaga will assist Guatemala, Cuba and Colombia in the use of this method.

A number of other projects involving the use of ethnobotanical knowledge were agreed upon. Bolivia will advise Ecuador on growing the nutritious *quinua* grain, another plant used by the incas, and Argentina will help China to introduce cultivation of *yerba mate*, used to make an infusion similar to tea.

The positive mood of the participants at the end of the meeting was summed up by Ramadhar, who attended as head of technical and economic cooperation among developing countries for the FAO. "It was in Buenos Aires that the idea of TCDC was consolidated by the United Nations conference of 1978, which approved the Buenos Aires Plan of Action for promoting and implementing TCDC. The plan has borne fruit splendidly in this exercise." ■

Top: **Growing maize in El Salvador.** ***Bottom:*** **A banana plantation in Ecuador. Under a TCDC agreement, Ecuador has undertaken to assist the Dominican Republic in improving the quality and marketing of bananas.**

The Mahatma's Vision Re-evaluated

South-South Cooperation in a Gandhian Perspective

Nirmala Reddy argues that Gandhi's ideas on self-sufficiency and appropriate technology are gaining a renewed validity for the developing world. The author is an Indian rural development expert, currently working as a consultant to the United Nations Development Programme (UNDP) and other UN agencies.

Gandhi's famous spinning wheel has become a universally recognized image, powerfully symbolizing the spirit and tenets of the movement that he founded. "Not mass production, but production by the masses" was his philosophy. He envisaged a society largely composed of small, self-sufficient communities, meeting their basic needs through the use of labour-intensive rather than capital-intensive methods. "The traditional old implements," he wrote, "the plough, the spinning wheel, have made our vision and our welfare ... India's salvation consists in unlearning what she has learned in the last 50 years ... You cannot build non-violence on factory civilization; but you can build it on self-contained villages."

How valid, we may ask, is Gandhi's vision today? Can it be applied in the present harsh and uncertain global economic environment? And is it applicable to South-South cooperation?

While Gandhi has always been widely admired for his non-violence and his leading role in realizing India's independence, his economic ideas have not always had a commensurate following. Jawaharlal Nehru, the first Prime Minister of independent India, went against Gandhian doctrine by launching an industrial programme based on large enterprises and mass production. At that time, and for many years afterwards, it seemed that Gandhi's small-scale vision was out of step with the modern world. Now, however, it is Nehru's "think big" philosophy that seems out of step, while Gandhi's ideas are once again coming into their own.

One of the early re-discoverers of those ideas was the German-born economist E.F.Schumacher, author of the influential book *Small is Beautiful*. Schumacher came under the influence of some of India's leading Gandhians while participating in a series of seminars. In 1961, he began to articulate his early ideas on intermediate technology "The only hope," he declared, "lies in a broadly based decentralized crusade to support and improve the productive efforts of the people as they are struggling for their livelihoods now. Find out what they are doing and help them do it better. Study their needs and help them help themselves."

In line with Gandhian thinking, Schumacher questioned the value of mass production based on technological advances, on both economic and social grounds. He saw the limitations of material wealth and began to realize how the "economics of materialism" would impact on the poor in rural communities. So he focused on the importance of developing local expertise and self-reliance in advancing rural development. He emphasized that external aid should always be combined with "a deep respect for the indigenous culture of those that are to be helped .... it must be based on a clear understanding that the present situation of mankind demands the evolution of a non-violent way of political and economic life."

While Schumacher's concept of appropriate technology ultimately went well beyond Gandhi's "plough and spinning wheel" thinking, nevertheless he remained true to the Gandhian belief that human values must determine our choice of technology, and not *vice versa*. When Schumacher died in 1977 his movement was still a relatively small one, but today his ideas, along with those of Gandhi, are beginning to look more relevant than ever (see also Rustam Lalkaka's article in this issue).

Several factors have contributed to this change in the climate of opinion. One is the threat to the global environment that has become increasingly apparent in recent years. Partly as a result of last year's Earth Summit in Rio de Janeiro, the term "sustainable development" has become fashionable in both North and South. It is apparent that decades of industrialization and mass production have signally failed to produce sustainable development. Rather, as Gandhi himself predicted, they have led to environmental disaster and large-scale human misery. Other solutions have to be found for supplying human needs with-

In the Gandhian spirit: A Grameen Bank borrower in Bangladesh spinning cotton yarn.

out plundering the planet, and often those turn out to be the old solutions, developed by rural communities over the centuries.

Another concept that has taken hold in recent years is that of "human development." Witness UNDP's much publicized *Human Development Report*, published annually since 1990. To quote the 1991 report: "Development has to be woven around people, not people around development. It has to be development *of* the people, *by* the people, *for* the people." These are words that Gandhi himself might have used.

Development, therefore, can no longer be seen simply as a process of material advancement imposed on countries from outside. It has to be determined by what the people themselves perceive as their social and economic priorities. This is also an argument for South-South cooperation, since developing countries can more effectively promote human development if they work together. Although Gandhi did not live to see the Buenos Aires Plan of Action, he would no doubt have approved of many of its aims.

Today, therefore, Gandhi's ideas are more alive and well than ever, not least in India. One of his leading advocates there is J.S. Juneja, chairman of the National Small Industries Corporation (NSIC), based in New Delhi. Characteristically, he has a photograph of the Mahatma hanging in his office.

The NSIC was established in 1955 under the Ministry of Industry with the overall objective of expanding the small and medium industry sector. This has become a vital part of the Indian economy, accounting for more than 50 per cent of the country's industrial production. The NSIC supports the sector in a variety of ways, including training, supply of machinery and assistance in the marketing of products. One of the most important aspects of its work is helping other developing countries to build up their small industries.

"Through the expansion of small enterprises," Mr. Juneja says, "we are promoting employment, rural development and the eradication of poverty. We want other developing countries to learn from our experience, and we have so far carried out more than 200 small industry projects abroad. Whenever we set up a project, we transfer the plant and send our technicians to train the local people."

Although the NSIC generally deals with more complex machinery than Gandhi's spinning wheel, the Gandhian principle of appropriate technology is fundamental to the organization's work. The experience of the NSIC offers many examples of appropriate technology that has been successfully transferred through South-South cooperation. One such example is the machine developed by NSIC for making fuel briquettes out of rice waste. This is now being manufactured and used in countries such as Ethiopia and Indonesia. It is made of simple components and can be assembled and maintained cheaply and without sophisticated engineering skills.

An outstanding example of appropriate technology in the area of finance is the Grameen Bank of Bangladesh, founded by the Bangladeshi economist Mohammad Yunus on the premise that "to deny people access to financial resources is to deny them a basic human right." This has achieved dramatic success as a supplier of credit to poor people in rural areas, demanding neither collateral nor guarantor. A cornerstone of the Grameen system is the requirement that borrowers form themselves into mutual support groups with one member designated as the leader. The members provide mutual support and act as a peer pressure group to ensure loans are properly utilized and repayments made promptly. In 1983 the Grameen became a bank in its own right with support from the Central Bank of Bangladesh, the International Fund for Agricultural Development, the Ford Foundation and bilateral donors. Through South-South cooperation, the Grameen system has been adopted in many other developing countries, including Bolivia, Burkina Faso, Colombia, Guinea, Indonesia, Kenya, Malaysia, Mali, Malawi, Nepal, Pakistan, Peru, Philippines, Sri Lanka and Zambia. Gandhi would certainly have approved of this excellent way of providing credit for the rural poor.

To return to the question posed at the beginning of this article — how valid is Gandhi's vision today? If that vision has a future, it is probably a modified version of it rather than the pure Gandhian notion of "one person, one tool." The spirit of the Gandhian movement will live on in ways that the Mahatma himself might not have envisaged. One of the most important things that Gandhi has taught us is that technology is for people and not people for technology. The present age is ripe for this message, and it is to be hoped that South-South cooperation will help to spread it in the developing world. ■

News and Perspectives

Making the Most of Foreign Aid

At a time when economic problems are forcing many donor countries to reduce their foreign aid programmes, the countries of the developing world are facing the need to manage their aid more cost-effectively. In this area TCDC can play a very useful role, as has been demonstrated by two recent workshops organized with support from the Special Unit for TCDC of the United Nations Development Programme (UNDP).

The first took place last September in Serock, Poland. Representatives were sent by the governments of Armenia, Belarus, Estonia, Georgia, Kyrgyzstan, Latvia, Lithuania, Moldova, the Russian Federation, Tajikistan, Ukraine and Uzbekistan. On the Polish side, representatives came from the government and from various institutions involved in technical cooperation. In addition, 12 officials of UNDP took part.

The main purpose of the three-day meeting was to enable the newly independent states to share the experience that Poland has gained since 1989 in using foreign assistance, mainly in the form of advisory services and training, to facilitate the transition to a market economy. A key example of such assistance is the umbrella project, financed jointly by the Polish government and UNDP. This is a flexible arrangement for bringing experts to Poland at low cost under three special UNDP-supported programmes: Transfer of Knowledge through Expatriate Nationals (TOKTEN), United Nations Short Term Advisory Services (UNISTAR) and United Nations Volunteers (UNV).

Participants decided that the sharing of experience begun at Serock should continue. Future collaboration is to include exchange of documents relating to technical cooperation, promoting networking arrangements between institutions in the various countries, and arranging short-term visits of officials from one country to another to observe arrangements for aid management.

A related workshop was held with the support of the Special Unit in Mahe, Seychelles, in November. This workshop, dealing with aid coordination and resource mobilization, was attended by 18 developing countries from all regions of the South. Participants were drawn from key ministries and planning institutes.

The primary aim was to assist the Seychelles in establishing aid management mechanisms. To this end, participating countries shared their experiences in managing external assistance and exchanged ideas on ways of enhancing aid coordination and resource mobilization efforts. They also discussed such topics as negotiating with donors, adopting a global approach to development issues, and increasing the role of the private sector in development. One of the themes emphasized throughout the workshop was the need to link aid flows to national development priorities.

As one outcome of the event, participants decided to pursue networking arrangements among their countries to help strengthen South-South cooperation in this area.

Promoting Privatization Through TCDC

Addis Ababa, Ethiopia, was the venue for three events supported by the Special Unit for TCDC, held between late January and early February. The first was a workshop on privatization, the aim of which was to enable Ethiopia, which is in the early stages of a major privatization programme, to benefit from the experience of other countries that have carried out similar programmes.

The participating countries were Bangladesh, the Czech Republic, Malaysia, Pakistan and Sri Lanka. Representatives from the World Bank and the Economic Commission for Africa also participated. Professor V.V. Ramanadham, Coordinator of the Interregional Network on Privatization, represented the collective experience of the South as a whole in this field. He cautioned that privatization is not an end in itself and should not be pursued for political reasons. He emphasized that the process should be carefully sequenced and carried out within an adequate framework of regulations.

During the workshop the Ethiopian situation was thoroughly examined, and the participating experts provided elements of their own experience that might be relevant to Ethiopia. The representative of the Czech Republic, for example, described the voucher scheme adopted in his country, whereby all adult citizens could buy books of vouchers enabling them to acquire shares in firms earmarked for divestiture. In addition there was a series of interactive sessions during which Ethiopian government officials fielded questions from the other participants.

At the end of the workshop the Ethiopians felt that the event had provided them with some valuable and highly diverse experience from other countries that had already travelled some distance down the privatization road. The Ethiopians plan to continue tapping this experience as their privatization programme proceeds.

Sensitization Workshop

Another event to take place in Addis Ababa was a national TCDC sensitization workshop for representatives of the government, the private sector, universities and non-governmental organizations.

During the workshop, officers from the Special Unit for TCDC and the UNDP field office in Addis Ababa conveyed to the participants the essential features of the TCDC modality and the methods of implementing it. An important contribution to the event was made by four "team leaders", i.e. officers from the UNDP field office charged with overseeing the UNDP country programme in Ethiopia. These officers presented the basic thrust of the programme and suggested ways in which TCDC could be incorporated into it.

African Focal Points Forge Closer Links

Addis Ababa was also the scene of the first African meeting of national TCDC focal points, held in early February. The event was hosted by the Organization of African Unity (OAU) and organized by the Special Unit for TCDC. There were over 75 participants from 38 African countries, in addition to representatives of international organizations including the United Nations Economic Commission for Africa (ECA), the Food and Agriculture Organization of the United Nations, and the United Nations Department of Economic and Social Development.

At the opening session the Director of the Special Unit for TCDC, Abebe Ambatchew, stated: "The current global environment for TCDC gives us good grounds for optimism and portends well for the future. Many governments are allocating increased resources, articulating clear national policies for TCDC and strengthening national mechanisms for the enhancement of TCDC, which has also become a high priority in global fora such as the United Nations." He added that the importance of TCDC has been further accentuated by the declining level of aid and the consequent need for the South to look for national and collective self-reliance.

In a statement read on his behalf at the opening session, Layashi Yaker, UN Under-Secretary-General and Executive Secretary of the ECA, underlined the ECA's commitment "to the promotion of sound and effective South-South cooperation based on genuine interdependence and mutual interest."

Before declaring the meeting open, Salim A. Salim, Secretary General of the OAU, said that TCDC was of vital importance, as it would "help to transform the old vertical relations with the North" into "horizontal ties of complementarity among the countries of the South."

The agenda included a briefing on the major decisions affecting TCDC, the goals and essential features of the modality, the use of the TCDC-INRES database, the function of national focal points, the role of regional and subregional institutions, and the projected strategy for TCDC in the 1990s.

Among the recommendations made by participants were the following:

- Countries should adopt clearly stated national policies for TCDC and formulate explicit terms of reference for national focal points, with the aim of effectively integrating the TCDC modality into national plans and programmes.
- There should be a continued and rapid decentralization of TCDC-INRES and an improvement in the quality of the database through more frequent updating.
- An international fund to help finance TCDC activities should be established, and ways of achieving this should be explored with urgency.
- The private sector should be motivated to apply TCDC in business and commercial undertakings, and the capacities of the private sector should be included in national compendia of capacities and needs.

Delegates to the first meeting of national TCDC focal points from the Africa region held in Addis Ababa.

Training in Renewable Energy Sources

Applications are invited for an international training course on renewable energy sources to be held in Chengdu, China from 1 September to 15 October 1993. It is being organized jointly by the Chengdu Xingguang Development Corporation for Appropriate Science and Technology (DCAST) and the Chengdu Biogas Research and Design Institute.

The course will include biogas technology, solar energy and hydropower, and there will be technical study tours to power plants using these methods. Participants will also spend some time in Beijing, where they will arrive and depart. The language of the course will be English. The cost is US$86 per day, covering training, food, lodging, and local transport. Prospective applicants should contact:

Mr. Song Yuhua
Director of DCAST
17 Yulin East Street,
People South Road
Chengdu 610041, Sichuan
People's Republic of China

Book Review

How Effective Is South-South Cooperation?

***SOUTH-SOUTH AID*, by Donald Bobiash (St. Martin's Press, 175 Fifth Avenue, New York, NY 10010; or from MacMillan Press, Houndmills, Basingstoke, Hampshire RG21 2XS, UK. 224 pages. US$65 plus postage and packing.)**

Consider the following examples of development assistance projects in Africa:

- Fifteen pedal-operated rice threshers were imported for bulk work at harvest time, but farmers continued hanging the rice stalks near their homes, threshing small amounts only as needed.
- A loan was provided to construct windmills for low-cost water pumping at maximum depths of 60 metres, but water deposits were often five or six times deeper.
- An attempt to introduce wooden ploughs failed because the ploughs proved unsuited to local soils.

These examples, taken from Donald Bobiash's book, read like typical stories from the abundant literature about Northern donors' projects that fail because they ignore local conditions. In fact, however, all three were instances of South-South cooperation. In the first case the benefactor was a Latin American country; in the other two cases, an Asian country. Such negative examples, which the author finds not uncommon, are surprising because Southern benefactors are supposedly especially aware of the need for projects to be deeply sensitive to local conditions.

This book is welcome as one of a very scarce breed of published studies on horizontal cooperation in action, but it has serious built-in shortcomings. It asks questions about the comparative advantages of South-South aid, but its universe is so confined that the answers seem random. Its perspective is not macro-development or grand theory, but that of a small number of individual projects (14 South-South and two North-South for comparison). Conclusions are presented as if they have wide validity, but were the projects selected to represent any scientific or statistical sample? The book's title clearly implies global scope, but only three West African countries are covered: Senegal, Guinea-Bissau and Ghana. The narrow focus does not mean there are no useful lessons for potentially wider application, but it does underscore the author's own appeal for more research.

The projects studied are evaluated by several criteria, including three which can yield much pointed discussion: the degree of participation of project beneficiaries; the appropriateness of projects to developing country conditions; and the extent to which benefits are continued after donor withdrawal. The definition of appropriateness is concise: "labour-intensive projects using local materials and simple technologies with low operating costs ... relevant to local conditions, transferable to non-project settings, and sustainable after pro-ject completion."

In applying this definition, however, the author misses the opportunity to draw valuable lessons by showing exactly how projects run counter to local conditions. For example, in the first case above, readers are left to guess why the rice threshers were left unused. Was it because: (a) project planners wrongly assumed farmers wanted to increase post-harvest production for marketing, instead of producing smaller quantities for family consumption? (b) farmers were too busy at harvest time to add rice-threshing work — or had to move right after harvest into non-farm seasonal employment for cash? (c) threshers had to be shared at central points, involving extra work for carting rice from field to thresher to home? Or was there some other reason?

A general chapter gives useful capsules on the policies, size and types of projects of the larger non-OPEC South-South donors as well as multilateral institutions including the United Nations Development Programme (UNDP) and other UN agencies.

The author has done detailed research on the project examples, tells their stories clearly, and is not afraid to call a failure a failure. He acknowledges giving low ratings to most of his project cases, all involving trans-oceanic donors. He wonders whether aid between countries within a region may achieve greater effectiveness because they have more in common.

Even if this were studied and proven correct, it would not be enough. Any additional research would also have to break out of the conceptual strait-jacket of one-way aid projects which constrains this book. It covers only bilateral, sectoral "field projects" for input delivery in health care, agriculture, irrigation and construction. This leaves out many sectors, types and levels of South-South cooperation. Most important, it excludes mutual support, joint endeavours, reciprocal actions and policy consultations. For example, the book never deals with advisors on national development strategy, joint development of shared river basins, networks for sharing research findings and business opportunities, regional and interregional training institutes, study tours focused on specific technologies — to mention just a few.

These broader dimensions and sharing techniques of South-South cooperation give it a different character from traditional forms of so-called "aid". If serious development scholars and research sponsors would undertake in-depth studies of these characteristics, the resulting publications could be landmark contributions to the development literature. — **Paul Boyd** ■

TCDC-INRES

Matching needs with technology training expertise

If you are seeking a development partner, or if you would like to offer the services of your Agency or company in another developing country, contact the TCDC-INRES database Special Unit for TCDC, PO Box 1800, GCS, New York, NY 10163-1800, USA. Tel: (212) 906-3140

TCDC-INRES

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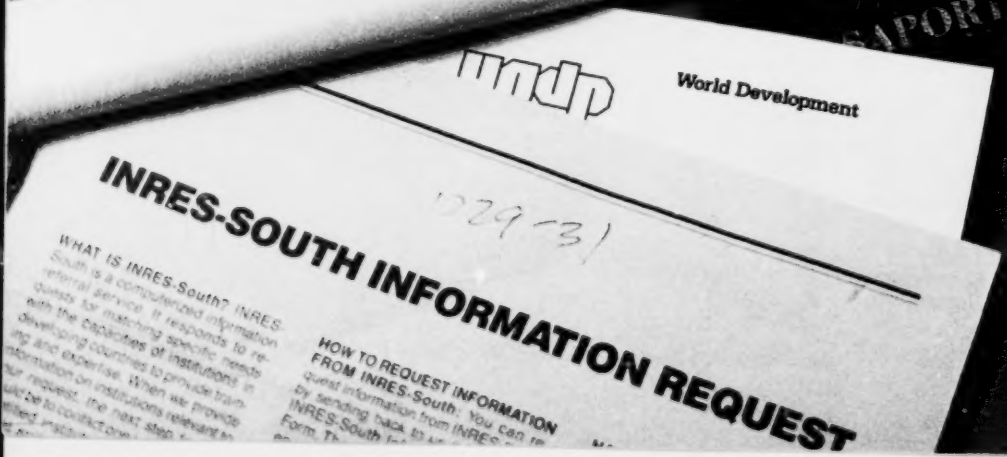

World Development

INRES-SOUTH INFORMATION REQUEST

WHAT IS INRES-South? INRES-South is a computerized information referral service. It responds to requests for matching specific needs with the capacities of institutions in developing countries to provide training and expertise. When we provide information on institutions relevant to your request, the next step is up to you to contact those